

**ABSTRACT**

Apparatuses and methods for separating, immobilizing, and quantifying biological substances from within a fluid medium. Biological substances are observed by employing a vessel (6) having a chamber therein, the vessel comprising a transparent collection wall (5). A high internal gradient 5 magnetic capture structure may be on the transparent collection wall (5), magnets (3) create an externally-applied force for transporting magnetically responsive material toward the transparent collection wall (5). The magnetic capture structure comprises a plurality of ferromagnetic members and has a uniform or non-uniform spacing between adjacent members. There may be electrical conductor means supported on the transparent collection wall (5) for enabling electrical 10 manipulation of the biological substances. The chamber has one compartment or a plurality of compartments with differing heights. The chamber may include a porous wall. The invention is also useful in conducting quantitative analysis and sample preparation in conjunction with automated cell enumeration techniques.